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FILING DATE: February 17, 2004

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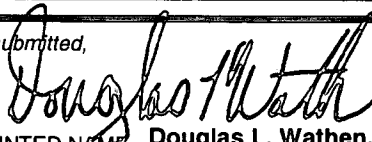
PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

| INVENTOR(S) | | | | | |
|--|--|--|-----------|--|---|
| Given Name (first and middle [if any]) Neubrand | Family Name or Surname Frank | Residence (City and either State or Foreign Country) West Bloomfield, MI | | | <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> 22387 U.S. PTO 60/545360 </div> |
| <input type="checkbox"/> Additional inventors are being named on the _____ separately numbered sheets attached hereto | | | | | |
| TITLE OF THE INVENTION (280 characters max) | | | | | |
| WINDSCREEN DEFLECTOR FOR AUTOMOTIVE VEHICLES | | | | | |
| Direct all correspondence to: CORRESPONDENCE ADDRESS | | | | | |
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| OR _____ Type Customer Number here | | | | | |
| <input checked="" type="checkbox"/> Firm or Individual Name Gifford, Krass, Groh, Sprinkle, Anderson & Citkowski, P.C. | | PATENT TRADEMARK OFFICE | | | |
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| ENCLOSED APPLICATION PARTS (check all that apply) | | | | | |
| <input checked="" type="checkbox"/> Specification Number of Pages 5 | | <input type="checkbox"/> CD(s), Number _____ | | | |
| <input checked="" type="checkbox"/> Drawing(s) Number of Sheets 6 | | <input checked="" type="checkbox"/> Other (specify) Postcard | | | |
| <input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76 | | | | | |
| METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT (check one) | | | | | |
| <input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. | | FILING FEE AMOUNT (\$) | | | |
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Respectfully submitted,

SIGNATURE



TYPED or PRINTED NAME

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Date **2/17/04**

REGISTRATION NO.

41,369

(if appropriate)

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KMN-12518/16

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WINDSCREEN DEFLECTOR FOR
AUTOMOTIVE VEHICLES
BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The invention relates to windscreen deflectors for convertible automotive vehicles. More specifically, the invention relates to a deflector assembly having first and second cross members for moving a membranous windscreen between extended and retracted positions.

DESCRIPTION OF THE RELATED ART

It is known to provide a windscreen behind the head restraints of the front seats of a convertible car to minimize buffeting experienced by the front passengers caused by eddy currents while driving in the car.

It remains desirable to provide a windscreen for a passenger vehicle having front and rear seats and a device for moving the windscreen between a retracted position stored behind the rear seats and an extended position disposed behind the head restraints of the front seats.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figures 1 through 6, a retractable windscreen assembly for selectively covering a portion of a passenger compartment of a convertible automotive vehicle 5 is generally indicated at 10. The windscreen assembly 10 includes a membranous windscreen 12 that extends longitudinally in the vehicle 5 between a fixed end 14 and an opposite mobile end 16. A first cross member 18 extends transversely between opposing side walls 20 in the vehicle 5 for supporting the mobile end 16 of the windscreen 12. More specifically, the first cross member 18 includes a generally horizontal beam 22 extending between symmetrically opposite and spaced apart side members 24. The mobile end 16 of the windscreen 12 is fixedly secured along the beam

22. Each side member 24 is generally S-shaped to define an inner portion 26 extending generally orthogonally from the beam 22 and a distal outer portion 28 stepped transversely outwardly from the inner portion 26. The fixed end 14 of the windscreen 12 is fixedly secured to a spool 29 rotatably coupled to a rear end of the passenger compartment. The spool 29 is rotatably biased so that the windscreen 12 is continuously tensioned between the fixed 14 and mobile 16 ends.

A second cross member 30 extends transversely between the side walls 20 of the vehicle 5. The second cross member 30 includes a generally horizontal cross bar 32 extending between symmetrically opposite and spaced apart legs 34. As best shown in Figures 4 and 5, the cross bar 32 includes a leading edge 37 (Figure 4), which is adapted to slidably contact the windscreen in a non-abrading manner. Preferably, the leading edge 37 is smooth to minimize friction with the windscreen 12. Alternatively, a plurality of rollers (not shown) can be disposed along the leading edge 37 for rollingly engaging the windscreen 12. Each leg 34 is generally S-shaped to define an inner portion 36 extending generally orthogonally from the cross bar 32 and a distal outer portion 38. The outer portion 38 of each leg 34 is stepped transversely outwardly from the inner portion 36 and pivotally coupled to the side walls 20 of the vehicle 5 for pivotal movement about a fixed axis 39. The second cross member 30 may have a trim panel installed thereon, such that when it is in the non-extended position, the trim panel hides the cross member to provide a finished appearance. The trim panel may also hide other portions of the windscreen mechanism. Alternatively, a panel may be provided that hides the mechanism when it is retracted, and moves out of the way as the mechanism operates.

The outer portions 28 of each side member 24 are spaced apart from the inner portions 36 of each leg 34 to accommodate a pair of four-bar linkages 40. Each linkage 40 includes a first link 42 and a second link 50. Both the first 42 and second 50 links are generally S-shaped. As best shown in Figure 3, the first link 42 extends between a first end 46 pivotally coupled to the first cross member 18 and an opposite second end 48 pivotally coupled to the second cross member 30. The second link 50 extends between a first end 52 pivotally coupled to the first cross member 18 and an opposite second end 54

pivotally coupled to the second cross member 30. The linkages 40 allow the first 18 and second 30 cross members to move together between an extended position, as shown in Figures 1 and 5, and a storage or retracted position, as shown in Figures 2 and 6.

A pair of actuating rods 60 each extend between an upper end 62 and a lower end 64. The upper end 62 of each rod 60 is pivotally coupled to the first link 42 of each linkage 40. The lower end 64 of each rod 60 is pivotally coupled to one of the side walls 20 of the vehicle 5. The lower end 64 of at least one of the rods 60 is operatively coupled to a drive mechanism, such as an electric motor or cylinder-type actuator, disposed within one of the side walls 20 of the vehicle 5. The drive mechanism actuates the first 18 and second 30 cross members between the extended and retracted positions by pivotally driving the rod 62 relative to the side wall 20. As would be clear to those of skill in the art, other actuation approaches may also be used. For example, an electric motor may drive a flexible cable drive, which in turn drives a gear box attached to the windscreen mechanism. With a direct or remote electric drive, the actuator cannot be easily reverse driven and, therefore, the actuator resists return of the windscreen mechanism from the extended position to the retracted position after the mechanism is extended. With other types of actuators, such as an hydraulic cylinder, a latch may be required to latch the windscreen mechanism in the extended position. The latch may also be used with an electric drive.

In use, the drive mechanism is selectively energized by a switch in the passenger compartment in the vehicle 5, as commonly known by those skilled in the art. Movement of the deflector assembly from the retracted position to the extended position is now described. In the retracted position, the first 18 and second 30 cross members are stacked in a recess disposed behind the passenger compartment in the vehicle 5. The windscreen 12 is retracted and stored in a spiral manner around the spool 29. The drive mechanism is energized to cause counterclockwise movement of the rod 60 about its lower end 64. The counterclockwise movement of the rod 60 pushes the first link 42 counterclockwise about its first end 46. The second link 50, interconnected to the first link 42 by the first cross member 18, moves counterclockwise about its first end 52 in response to the

counterclockwise movement of the first link 42. The first cross member 18 swings with the links 42, 50 about the first ends 46, 52 and remains generally upright as the second cross member 30 rotates counterclockwise about the fixed axis 39. The windscreen 12 is pulled at its mobile end 16 from the spool 29 by the first cross member 18. As the
5 deflector assembly 10 continues from an intermediate position shown in Figures 3 and 4, the beam 22 and the cross bar 32 move apart as the first cross member 18 maintains a generally upright orientation with respect to the second cross member 30. The membrane 12 is continuously tensioned about leading edge 37 of the cross bar 32. The rod 60 continues to push on the first link 42 until the deflector assembly 10 reaches the extended
10 position, shown in Figures 1 and 5. In the extended position, the first cross member 18 is generally upright and the second cross member 30 is generally horizontal. The membrane 12 is tensioned about the leading edge 37 defining a cover portion 70 and a deflector portion 72. The cover portion 70 is generally horizontal to cover the passenger compartment between the cross bar 32 and the spool 29. The deflector portion 72 is
15 generally upright between the cross bar 32 and the beam 22 to deflect wind eddies away from the heads of passengers seated in the front of the passenger compartment. The deflector assembly 10 can be returned to the retracted position by reversing the foregoing operation.

As would be clear to those of skill in the art, the rod 60 may have its upper-end 62
20 interconnected with the second link 50, rather than the first link 42, and achieve a similar actuation.

The present invention is designed such that the windscreen mechanism may be left in the extended position and the convertible top and/or windows may be operated without retracting the windscreen system.

25 The invention has been described in an illustrative manner. It is, therefore, to be understood that the terminology used is intended to be in the nature of words of description rather than of limitation. Many modifications and variations of the invention are possible in light of the above teachings.

I claim:

1. A windscreen deflector assembly for an automotive vehicle having a
2 passenger compartment extending between opposing side walls and a rear end, wherein
the passenger compartment includes front seats and rear seats, said windscreen deflector
4 assembly comprising:
 - a first cross member having a beam extending transversely in the vehicle;
 - 6 a second cross member having a cross bar extending transversely in the
vehicle, said second cross member pivotally coupled to respective side walls of the
8 vehicle for movement between a generally horizontal retracted position stored behind the
rear seats and a generally horizontal extended position disposed behind the front seats;
 - 10 a windscreen extending between a fixed end coupled to the rear end of the
passenger compartment and a mobile end fixedly secured to said beam of said first cross
12 member; and
 - a linkage interconnecting said first and second cross members for
14 movement of first and second cross members together between said retracted position,
wherein said second cross member and said windscreen are stored together with said first
16 cross member behind the rear seats, and said extended position, wherein said second
cross member is generally orthogonal relative to said first cross member for tensioning
18 said windscreen about said cross bar so that a portion of said windscreen is generally
upright between said beam of said first cross member and said cross bar of said second
20 member to minimize buffeting of passengers seated in the front seats caused by eddy
currents while driving in the car.

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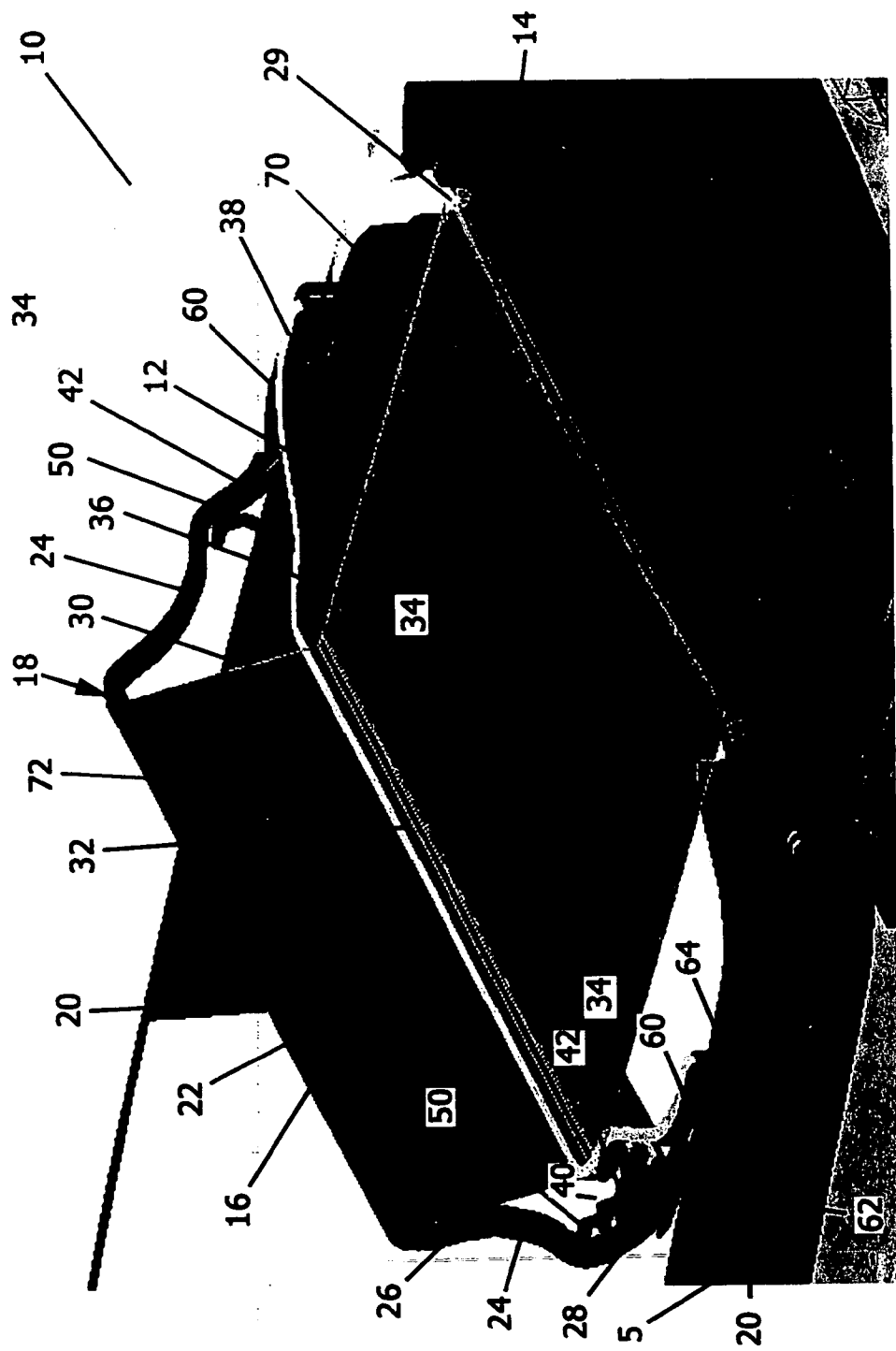


FIGURE 1

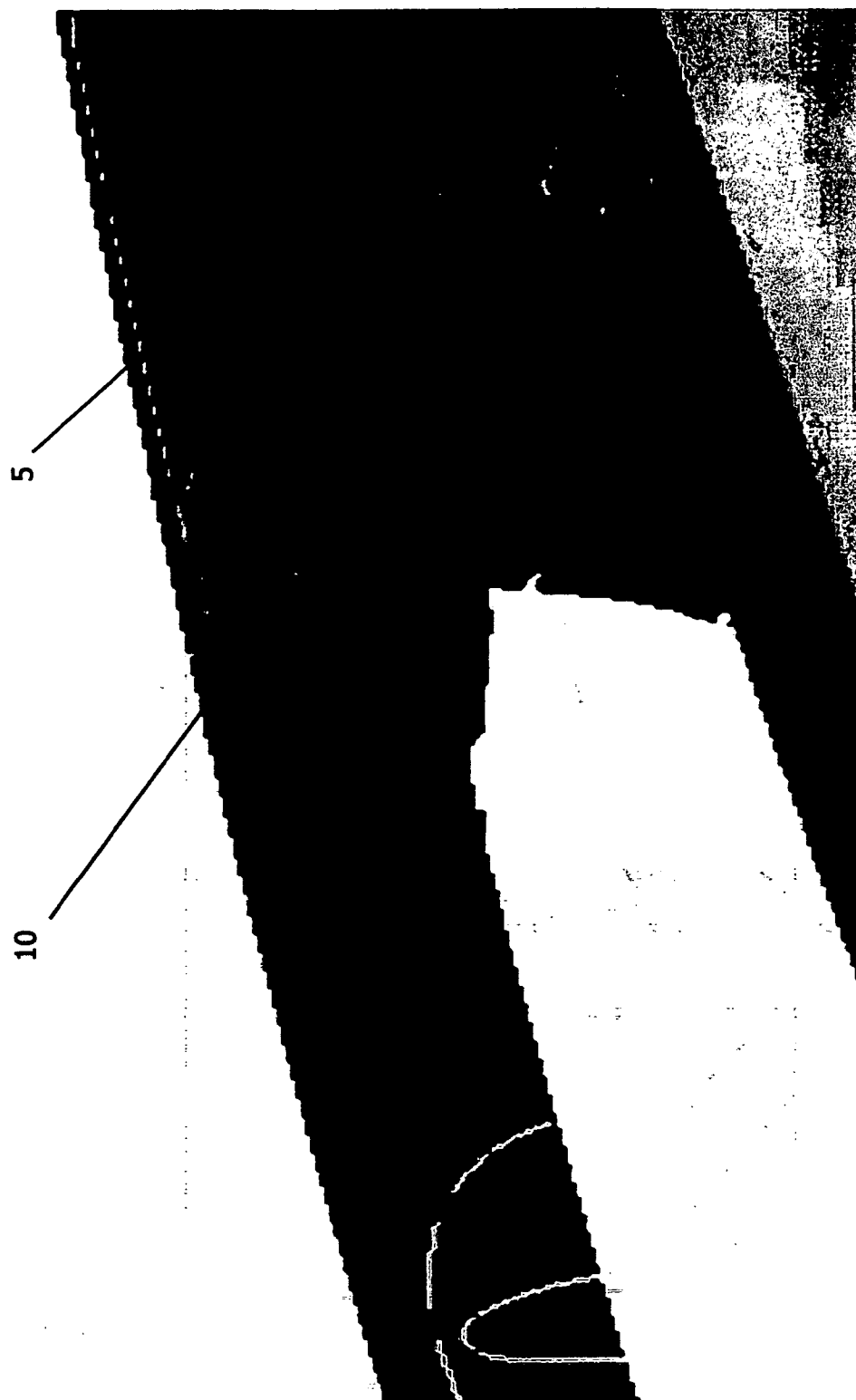


FIGURE 2

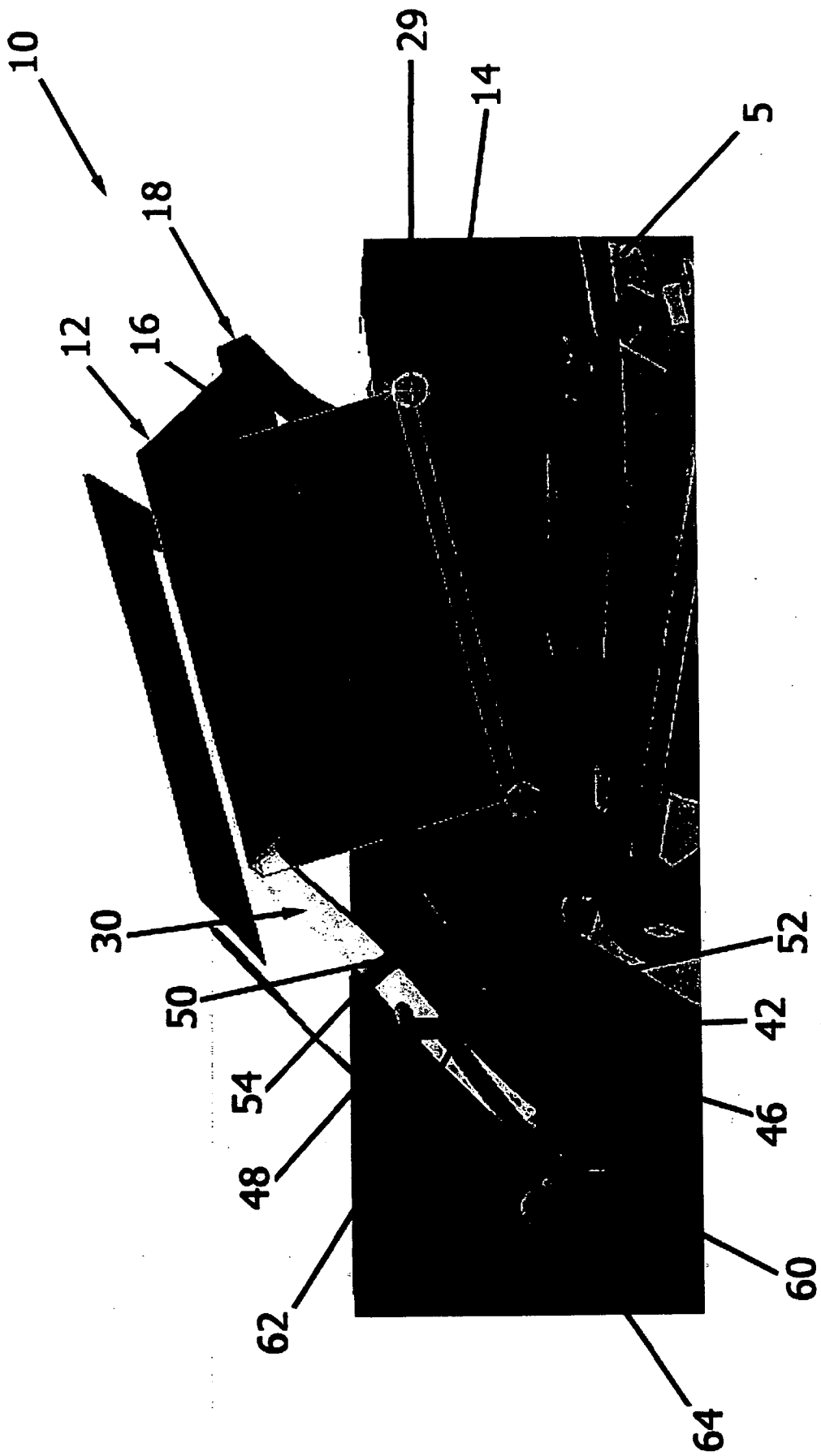


FIGURE 3

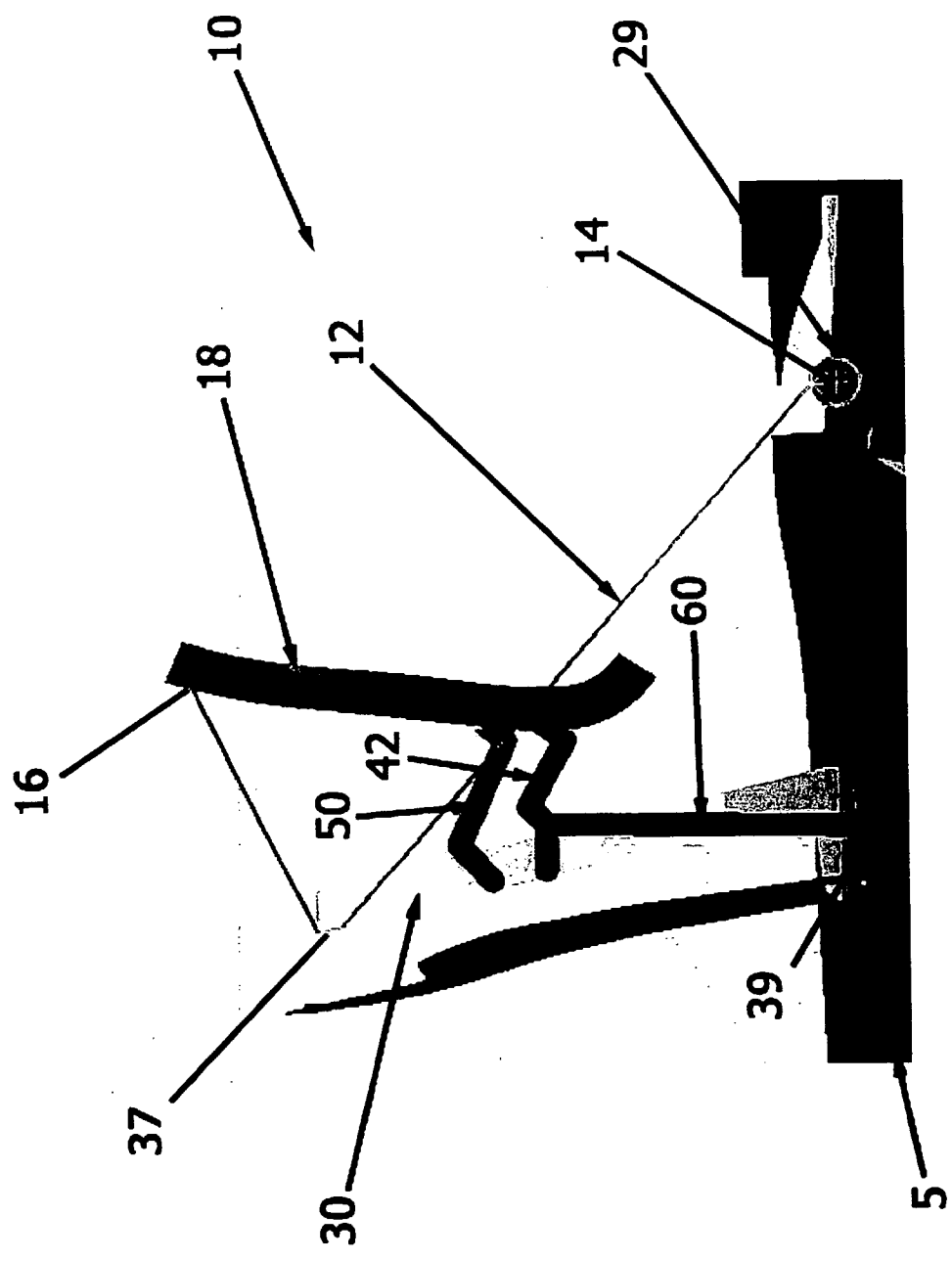


FIGURE 4

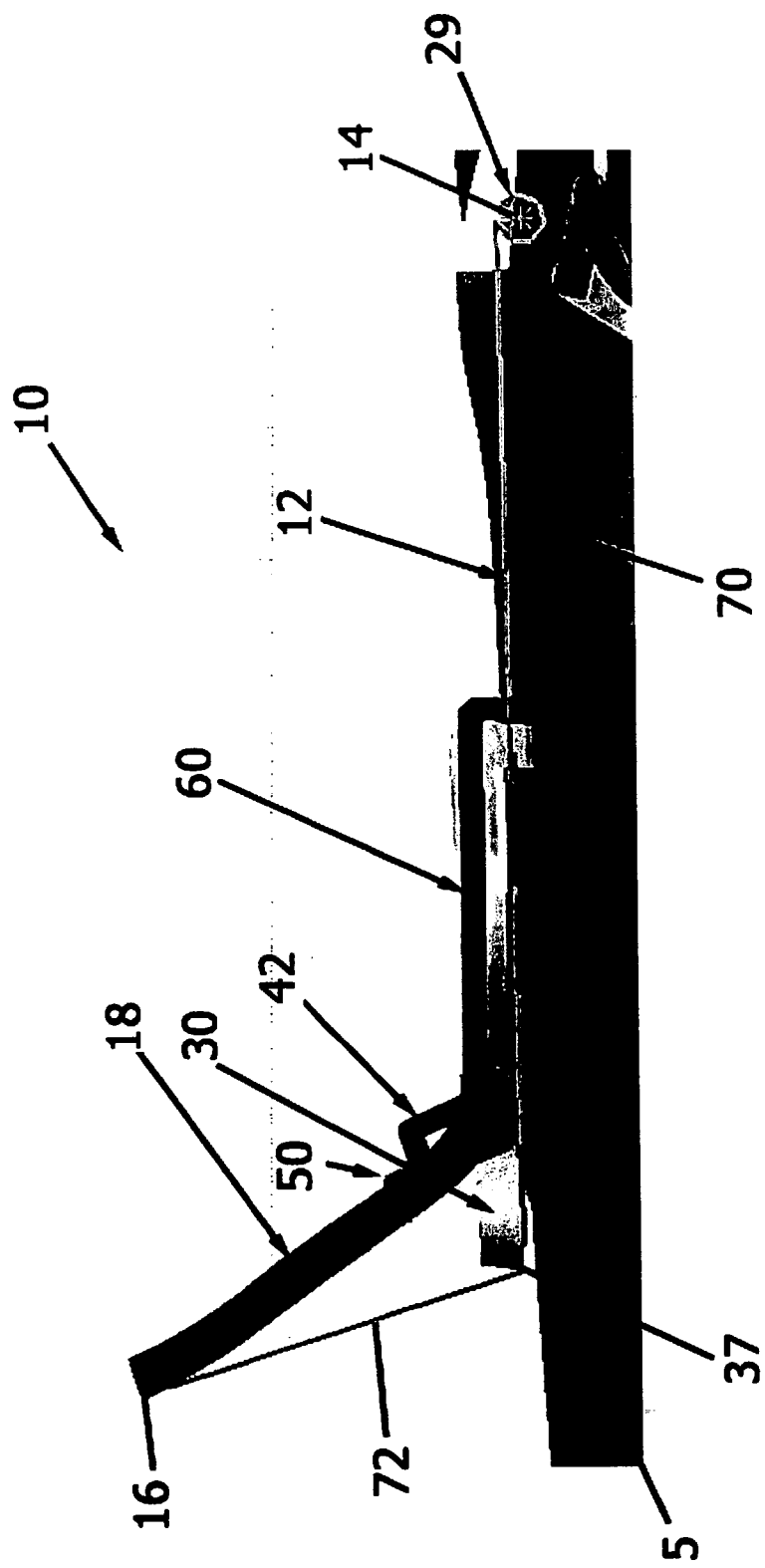


FIGURE 5

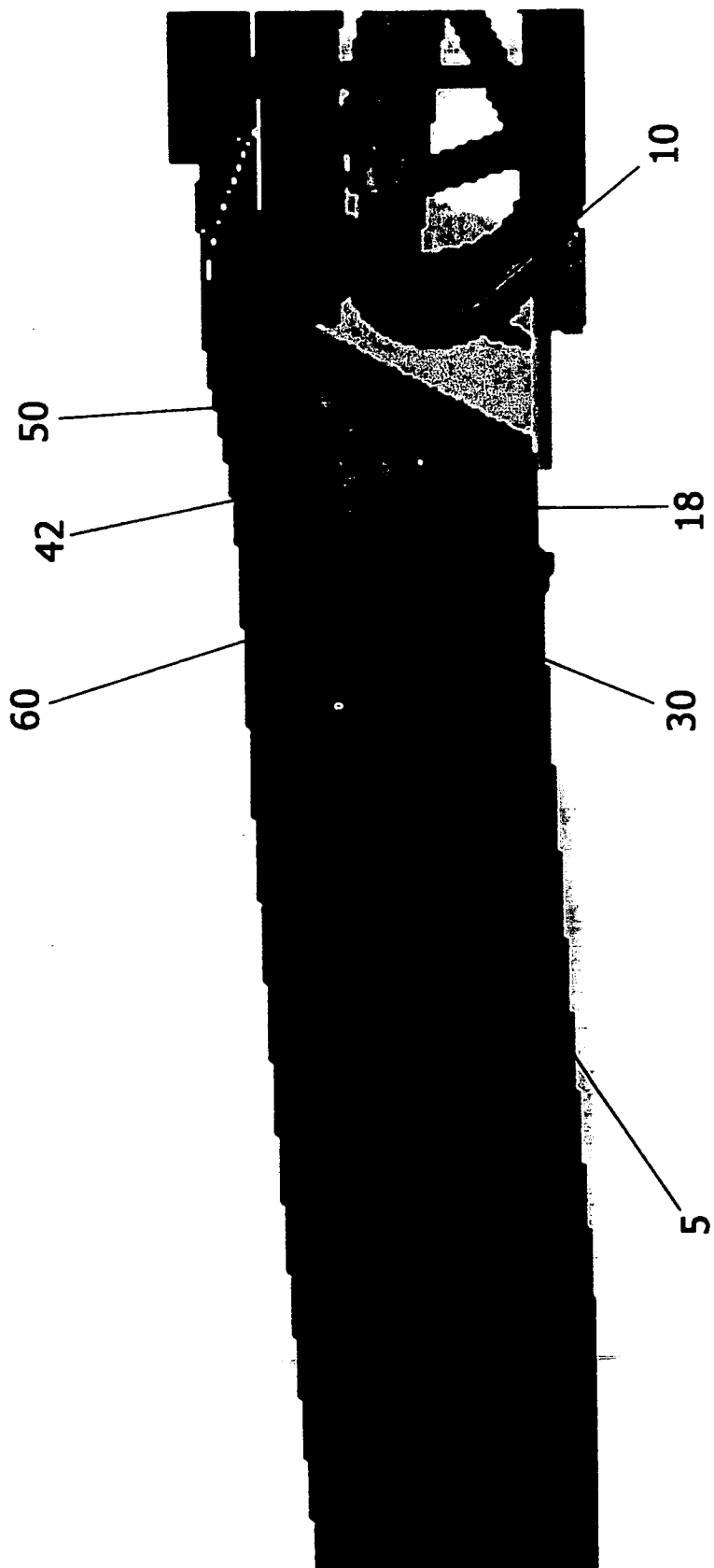


FIGURE 6